Oryzomys nelsoni

Oryzomys nelsoni is an extinct rodent of María Madre Island, Nayarit, Mexico. Within the genus *Oryzomys* of the family Cricetidae, it may have been most closely related to the mainland species *O. albiventer*. Since its first description in 1898, most authors have regarded it as a distinct species, but it has also been classified as a mere subspecies of the marsh rice rat (*O. palustris*).

After its discovery in 1897, it has never been recorded again and it is now considered extinct; the presence of introduced black rats on María Madre may have contributed to its extinction. *Oryzomys nelsoni* was a large species, distinguished in particular by its long tail, robust skull, and large incisors. It was reddish to yellowish above and mostly white below. Its diet may have included plant material and small animals.

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Taxonomy

Oryzomys nelsoni was collected by Edward William Nelson and Edward Goldman in May 1897 and never found again.[6] Their visit for the Biological Survey of the United States Department of Agriculture was one of the first scientific exploration of the islands.[7] Clinton Hart Merriam identified the mammals they obtained, including four specimens of *Oryzomys nelsoni*, which were deposited in the United States National Museum and remain there.[8] He named it as a species of the genus *Oryzomys*, *Oryzomys nelsoni*; the specific name honors Nelson.[9] Investigators have generally retained it as a species distinct from other *Oryzomys*,[10] but in 1971 Hershkovitz listed it as one of many subspecies of *Oryzomys palustris*,[4] which he envisaged as a wide-ranging species encompassing what is now the marsh rice rat (*O. palustris*) of the southern and eastern United States, *O. couesi* of Central America, and several other species with more limited distributions.[11]

Oryzomys nelsoni

Skull of *Oryzomys nelsoni*, seen from above.[1]

Conservation status

Extinct (IUCN 3.1)[2]

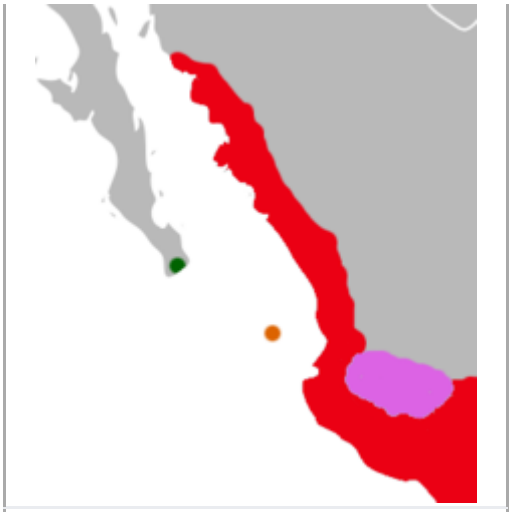
Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Mammalia
Order:	Rodentia
Family:	Cricetidae
Subfamily:	Sigmodontinae
Genus:	*Oryzomys*
Species:	***O. nelson***

Binomial name

Oryzomys nelson
Merriam, 1898

In his 1918 revision of North American *Oryzomys*, Goldman considered *O. nelsoni* to be most closely related to the nearest mainland subspecies of *O. couesi*, *O. couesi mexicanus*. In 2009, Michael Carleton and Joaquin Arroyo-Cabrales revised the *Oryzomys* of western Mexico and confirmed that *O. nelsoni* is a very distinct species. Their morphometrical analysis found some resemblance between the species and *Oryzomys albiventer* of interior mainland Mexico, and they suggested that although *O. nelsoni* likely represents an old, distinctive lineage, it may have derived from a common ancestor with *O. albiventer*.[12]



Distribution of *Oryzomys nelsoni* (orange) and other western Mexican *Oryzomys*.

Synonyms[5]

- *Oryzomys nelsoni* Merriam, 1898[3]
- *[Oryzomys palustris] nelsoni*: Hershkovitz, 1971[4]

Oryzomys nelsoni is one of about eight species in the genus *Oryzomys*, which occurs from the eastern United States (*O. palustris*) into northwestern South America (*O. gorgasi*).[13] *O. nelsoni* is further part of the *O. couesi* section, which is centered on the widespread Central American *O. couesi* and also includes various other species with more limited and peripheral distributions.[14] Many aspects of the systematics of the *O. couesi* section remain unclear and it is likely that the current classification underestimates the true diversity of the group.[15] *Oryzomys* previously included many other species, which were progressively removed in various studies culminating in a contribution by Marcelo Weksler and coworkers in 2006 that removed more than forty species from the genus.[16] All are classified in the tribe Oryzomyini ("rice rats"), a diverse assemblage of American rodents of over a hundred species,[17] and on higher taxonomic levels in the subfamily Sigmodontinae of family Cricetidae, along with hundreds of other species of mainly small rodents.[18]

Common names proposed for this species include Nelson rice rat,[19] Nelson's rice rat,[10] Nelson's oryzomys,[20] and Tres Marias Island rice rat.[2]

Description

Skull of *Oryzomys nelsoni*, seen from below.[21]

Oryzomys nelsoni was a large and long-tailed *Oryzomys*;[10] its tail was longer than that of any other western Mexican *Oryzomys*.[5] The upperparts were ochraceous to buff, most richly so on the rump, and paler further to the front and low on the flanks. On the head and the back, blackish hairs somewhat darkened the overall color. The underparts were white, with lead-colored underfur that was visible in some places. The ears were covered on both sides with scanty grayish hairs.[10] The large hindfeet[5] were sparsely covered with pale hairs. The tail was largely dark, but the underside of the basal one third to one half was light yellow.[10]

Oryzomys nelsoni was distinctive in its large skull with broad, well-developed incisors and a strong front part (rostrum) that is strongly curved downwards.[22] In *O. albiventer*, the rostrum and incisors were not as massive, but the molars are larger.[5] The interparietal bone, part of the roof of the braincase, was broad and the incisive foramina, which perforated the palate between the incisors and the molars, were relatively short.[10]

Total length in the four known specimens is 282 to 344 mm (11.1 to 13.5 in), averaging 322 mm (12.7 in); head and body length is 122 to 153 mm (4.8 to 6.0 in), averaging 140.5 mm (5.53 in); tail length is 160 to 191 mm (6.3 to 7.5 in), averaging 181.5 mm (7.15 in); and hindfoot length is 35 to 39 mm (1.4 to 1.5 in), averaging 37.3 mm (1.47 in).[23]

Ecology and extinction

Nelson and Goldman found the species only in a damp, herbaceous site now known as the "Sacatal" near a spring high on María Madre Island, the largest of the Islas Marías off the coast of Nayarit, western Mexico,[24] and Nelson wrote that it was rare. He gave the elevation of this place as 1800 ft,[25] which Álvarez-Castañeda and Méndez converted to 550 m,[10] but in his 1918 paper, Goldman gave 800 ft instead,[19] which Carleton and Arroyo-Cabrales in 2009 converted to 245 m.[26] The next survey of small mammals on the island took place in March 1976 by a team led by Don E. Wilson. They failed to collect *O. nelsoni* and instead found only the introduced black rat (*Rattus rattus*) at the locality where Nelson and Goldman had collected *O. nelsoni*; this species may have contributed to the decline of the indigenous rodent.[27]

The species is now considered extinct,[28] although as late as 2002 the Mexican government listed it as "threatened".[29] Another Islas Marías endemic, the deermouse *Peromyscus madrensis*, still occurred on María Madre in 1976.[30] *Oryzomys nelsoni* is thought to have fed on plant material such as weeds, fruit, and seeds, and more rarely on animals such as fish and invertebrates.[10]

References

1. Goldman, 1918, plate II, fig. 1
2. Timm et al., 2008
3. Merriam, 1898, p. 15
4. Hershkovitz, 1971, p. 704
5. Carleton and Arroyo-Cabrales, 2009, p. 122
6. Carleton and Arroyo-Cabrales, 2009, p. 114; Nelson, 1899a, pp. 7–8
7. Nelson, 1899a, pp. 7–8; Merriam, 1899, p. 13
8. Merriam, 1898, p. 13; Nelson, 1899a, p. 15; Carleton and Arroyo-Cabrales, 2009, p. 122
9. Merriam, 1898, p. 15; Álvarez-Castañeda and Méndez, 2003, p. 2
10. Álvarez-Castañeda and Méndez, 2003, p. 1
11. Musser and Carleton, 2005, pp. 1147, 1152–1153; Carleton and Arroyo-Cabrales, 2009, p. 116
12. Carleton and Arroyo-Cabrales, 2009, p. 110
13. Carleton and Arroyo-Cabrales, 2009, p. 106
14. Carleton and Arroyo-Cabrales, 2009, p. 117
15. Carleton and Arroyo-Cabrales, 2009, p. 107
16. Weksler et al., 2006, table 1
17. Weksler, 2006, p. 3
18. Musser and Carleton, 2005
19. Goldman, 1918, p. 46
20. Musser and Carleton, 2005, p. 1152
21. Goldman, 1918, plate II, fig. 1a
22. Carleton and Arroyo-Cabrales, 2009, p. 121
23. Carleton and Arroyo-Cabrales, 2009, table 2

24. Álvarez-Castañeda and Méndez, 2003, p. 1; Carleton and Arroyo-Cabrales, 2009, p. 114
25. Nelson, 1899b, p. 16
26. Carleton and Arroyo-Cabrales, 2009, p. 114
27. Wilson, 1991, p. 239; Carleton and Arroyo-Cabrales, 2009, p. 114
28. Álvarez-Castañeda and Méndez, 2003, p. 1; Musser and Carleton, 2005, p. 1152; Timm et al., 2008; Carleton and Arroyo-Cabrales, 2009, p. 114
29. Álvarez-Castañeda and Méndez, 2003, p. 2
30. Musser and Carleton, 2005, p. 1071; Carleton and Arroyo-Cabrales, 2009, p. 114

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